REMARKS

Claims 1-34 have been cancelled and claims 35-49, which read upon Applicants' elected species, have been added.

The Examiner objected to an erroneous reference numeral "422" which should be changed to --228--. This correction has been made in the paragraph in the specification between page 7, line 17 and page 8, line 6.

The original abstract has been deleted and a new abstract is submitted herewith which the Applicants' maintain is more descriptive of the present invention.

New claim 35 is distinguished over the references by reciting:

> "the second pole piece having first and second components wherein the first component is located between the write gap and the second component and each of the first and second components has a height into the head which extends from and which is oriented perpendicular to said head surface;
>
> the first component having a uniform thickness throughout its height into the head with the height into the head forming a zero throat (ZTH) which lies in a second vertical plane that is parallel to said first vertical plane;
>
> the height into the head of the second component being greater than the height into the head of the first component; and
>
> each of the first and second components having said track width at the head surface."

An exemplary illustration of this structure is shown in Figs. 6A and 6D wherein the second pole piece has first and second components 226 and 228 wherein the first component 226 is located between the write gap 224 and the second component 228 and each of the first and second components 226 and 228 has a height into the head which extends from and perpendicular to the head surface (ABS). The first component 226 has a uniform thickness throughout its height with its height forming a zero throat height (ZTH) 232 which lies in a second vertical plane that is parallel to the first vertical plane at the head surface (ABS). As shown in Fig. 6A the height of the second component from the head surface to 236 is greater than the height of the first component from the

head surface to the ZTH 232. Each of the first and second components 226 and 228 has the track width as shown in Fig. 6D. In contrast, Sasaki has an unnumbered insulation layer bump below the write gap 11 in Fig. 24A that causes the second component to gradually slope upwardly to form the zero throat height (TH). This causes a poorly defined zero throat height which the Applicants sought to overcome, as described in their specification, page 3, lines 9-13, which states:

> " . . . Another scheme for achieving the throat height is to fabricate a first component of the second pole piece over a resist bump. The resist bump elevates the first component so as to define the throat height. Unfortunately, the resist bump creates a non-planar structure near the ABS which makes it difficult to fabricate a precise track width during the photo/trim patterning process. . . . . "

As can be seen from Applicants' Fig. 6A the first component 226 has a uniform thickness throughout its height which permits a well-defined ZTH 232 which lies in a second vertical plane which is parallel to the first vertical plane at the head surface. Further, Sasaki does not teach the height of his second component 22a as being greater than the height of his first component 22c. The first and second components are shown with the same height in Fig. 24a of Sasaki. The Applicants' have been able to locate the ZTH 232 in Fig. 6A as close as possible to the head surface for maximizing the bits per inch (BPI) without unduly impacting the tracks per inch (TPI) which is supported by their specification, page 3, lines 19-22, which state:

> "The present invention provides a precisely defined throat height along with a well-formed narrow track width. In one aspect of the invention the zero throat height is defined by a first component of the second pole piece which has a precisely defined vertical back edge as close as possible to the ABS for maximizing the BPI without unduly impacting the TPI. . . . "

As stated in the claim the second component is then provided with a greater height for the head surface to the location at 236 so as to provide sufficient flux carrying capability and sufficient stitching area when the second pole piece is provided with a third component 230. Claim 1 is distinguished from Okai in that Okai's second component 172 does not have a track width at the head

surface (ABS). This means that the first component 171 of Okai has to be thick enough to transfer the flux at the head surface without oversaturation. The construction of the first component 171 of Okai is discussed in his specification, column 7, lines 8-13, which state:

> "This embodiment of the invention is characterized by the split into the upper first magnetic film 171 and the upper second magnetic film 172, making it possible to use a photoresist of a smaller film thickness to form the track part emerging on the air bearing surface of the thin film magnetic head and a photoresist of a greater film thickness to form the flat surface."

The construction of the first component 171 is further discussed in Okai in column 7, lines 26-34, which state:

> "Since the upper first magnetic film 171 in this embodiment of the invention needs to be produced only to meet the main purpose of forming a narrow track, the decrease in film thickness due to the aforementioned flattening need not be allowed for in the tolerance. For this reason, it is necessary to produce a magnetic film of no more than the essentially required thickness, and therefore the thickness of the photoresist can also be reduced, making it possible to form a narrow track pattern."

It can be seen from the discussion in Okai that Okai desires to keep the thickness of his first component at a minimum. This thickness, however, will be trumped by oversaturation since the second component 172 is recessed from the head surface. As shown in Applicants' Fig. 6D the second component 228 is located at the head surface and has the same track width as the first component 226 so that sufficient flux can be transferred at the head surface without oversaturation. Further, the back edge of Okai's first component 171 does not define the zero throat height of the head assembly. In contrast, the forward edge of the second component 172 defines the zero throat height.

Claim 36 is further distinguished over the references by reciting:

> " . . . wherein the ZTH is less than a vertically oriented thickness of the first pole piece and said thickness of the first component is less than a uniform thickness of the second component."

An exemplary illustration of this structure is shown in Figs. 6A and 6D wherein the ZTH 232 is less than a vertically oriented thickness of the first pole piece 212 and the thickness of the first component 226 is less than the thickness of the second component 228. As shown in Fig. 24a of Sasaki the thickness of his first component 22c is not less than the thickness of the second component 22a. In Fig. 1 of Okai the second component 172 does not have a uniform thickness which is greater than the uniform thickness of the first component 171. The structure set forth by the Applicants is important in achieving a well-defined zero throat height as close as possible to the head surface with well-defined track widths for the first and second components 226 and 228. Claim 37, which is dependent upon claim 36, is considered to be patentable over the references for the same reasons as given in support for claim 36.

Claim 38, which is dependent upon claim 35, is further distinguished over the references by reciting:

> "the write gap forming a first horizontal plane that extends between the head surface and the back gap in a direction perpendicular to the head surface;
> the first component interfacing the write gap at said first horizontal plane;
> the first component and an insulation layer forming a second horizontal plane that extends between the head surface and the back gap in a direction that is perpendicular to the head surface; and
> the second component interfacing the first component and the insulation layer at said second horizontal plane."

An exemplary illustration of this structure is shown in Fig. 6A wherein the write gap 224 forms a first horizontal plane that extends between the head surface (ABS) and the back gap 214 in a direction perpendicular to the head surface (ABS), the first component 226 interfacing the write gap at the first horizontal plane, the first component 226 and an insulation layer 234 forming a second horizontal plane that extends between the head surface and the back gap 242 in a direction perpendicular to the head surface and the second component 228 interfacing the first component 226

perpendicular to the head surface and the second component 228 interfacing the first component 226 and the insulation layer 234 at the second horizontal plane. With this planarization the zero throat height 232 in Fig. 6A and the track widths of the first and second components 226 and 228 in Fig. 6D can be well formed. In contrast, Sasaki does not form his first component on a first horizontal plane but, as discussed hereinabove, his first component is formed on a first portion of the write gap layer 11 extending from the head surface and a second portion of the write gap layer which slopes upwardly as caused by an insulation bump layer therebelow. In Okai the second component is not even located at the head surface to form a track width nor is it formed on a second horizontal surface. Claims 39 and 40, which are dependent upon claim 38, are considered to be patentable over the references for the same reasons as given in support for claims 36 and 37 hereinabove. Claim 41, which is dependent upon claim 35, is considered to be patentable over the references for the same reasons as given in support for claim 35. Claim 42, which is dependent upon claim 41, is further distinguished over the references for the same reasons as given in support for claim 36 hereinabove and claim 43, which is dependent upon claim 42, is further distinguished over the references for the same reasons as given in support for claim 38 hereinabove.

Dependent claim 44 and independent claim 47 are considered to be patentable over the references for the same reasons as given in support for claim 35 hereinabove and claims 45 and 48 are further distinguished over the references for the same reasons as given in support for claim 36 hereinabove and claims 46 and 49, which are dependent upon claims 45 and 48, are further distinguished over the references for the same reasons as given in support for claim 38 hereinabove.

Regarding the other art of record none of the patents Young, Santini ('783) or Santini ('705) teaches the second pole piece as having first and second components at the head surface as recited in Applicants' claims 35 and 47. Each of these patents teaches a single component at the head

surface which has to be sufficiently thick and wide to carry the flux without oversaturation. While the patents Shi and Feng show first and second components at the head surface the second component of the second pole piece does not have a track width at the head surface, but in contrast, has a width at the head surface which exceeds the track width for transferring flux to the first component. The claims dependent upon Applicants' independent claims 35 and 47 are further distinguished over these other related patents for the same reasons as given in support for the dependent claims hereinabove.

Should the Examiner have any questions regarding this document he is respectfully requested to contact the undersigned.

Respectfully submitted,

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